REMARKS/ARGUMENTS

Applicants have amended independent claims 1, 10 and 14 in an effort to distinguish more clearly over the art of record. The amendment of the MgO content is based on the disclosure on page 12, line 13 and the limitation to the liquidus temperature and viscosity at the liquidus temperature is base on the disclosure on page 9, last paragraph. In addition, a Declaration under 37 CFR 1.132 is submitted with respect to the cited Kohli and Lautenschlager et al patents, and a Terminal Disclaimer with respect to the cited Miwa patent.

The glass according to the present invention has a density not higher than $2.40 g/cm^3$, the coefficient of thermal expansion of $25 \times 10^{-7}/℃$ to $36 \times 10^{-7}/℃$, the strain point not lower than 640℃, the liquidus temperature not higher than 1130℃, and the viscosity at the liquidus temperature not lower than $10^{5.4}$ dPa·s. Furthermore, the glass has an excellent chemical resistance. Therefore, the glass of the present invention is easily reduced in weight, has a lower thermal stress during heat treatment, is excellent in heat resistance, and is hardly devitrified when the glass is formed into a plate-like shape by the down-draw process. Furthermore, even if the glass is treated with HCl or BHF, the appearance is unchanged. Thus, the glass of the present invention exhibits extraordinarily advantageous effects as a glass substrate for a display.

The glass according to the present invention simultaneously achieves the above-mentioned excellent characteristics by precisely combining particular glass components in the contents within respective specific ranges.

On the other hand, Kohli (USP 6,060,168) and Lautenschlager et al (EP 1 070 681 A1) fail to explicitly describe a glass which is similar in composition to that of the present invention and a glass which satisfies all of the above-mentioned characteristics of the claimed invention.

The glass of the claimed invention is formed into a plate-like shape by the down-draw process. It has a liquidus temperature not higher than 1130℃ and the viscosity at the liquidus temperature not lower than $10^{5.4}$dPa·s(251200 poises) and is excellent in devitrification resistance. In the down-draw process, the glass tends to be devitrified during forming and, therefore, the glass subjected to the down-draw process is required to have an excellent devitrification resistance.

On the other hand, Kohli relates to a glass suitable for the float process. Therefore, the glass is not required to have a high devitrification resistance. In the float process, devitrification of the glass hardly occurs and, therefore, the glass formed by the float process is not required to have an excellent devitrification

resistance. Kohli describes, in column 3, lines 54-62, "More importantly, in order to manufacture the glass via the float glass manufacturing process, it is desirable for the glass to exhibit a viscosity at the liquidus temperature which is greater than 50 MPa·s (500 poises), more preferably greater than 100 MPa·s (1000 poises), and most preferably greater than about 250 MPa·s (2500 poises). In addition, it is desirable that the glass be capable of exhibiting a Liquidus Temperature below about 1250℃, most preferably below about 1200℃." From the foregoing description, it is understood that, in the float process, no devitrification occurs during forming if the glass has a liquidus temperature lower than about 1250℃. Therefore, the glass in each example in Kohli has a liquidus temperature higher than 1130℃, except Example 13, and is therefore inferior in devitrification resistance as compared with the glass of the present invention.

When the glass according to the present invention is treated in an HCl aqueous solution at 80℃ for three hours, neither clouding nor roughness is confirmed by visual observation of the surface of the glass. For Example 13 of Kohli, a joint inventor performed the experimental test to examine the chemical resistance. As a result, clouding was caused by HCl and the change in surface condition was observed, as stated in the attached Declaration.

One of the objects of the present invention is to improve buffered hydrofluoric acid (BHF) resistance. For this purpose, the content of MgO which degrades the BHF resistance is 1% or less.

However, Lautenschlager et al do not consider the BHF resistance at all and use MgO as an essential component. In the examples, a large amount of MgO is used. Thus, Lautenschlager et al give a broad range of 1-8% MgO. 2% or more MgO is contained in all the examples.

Even if the glass according to the present invention is treated in 63 BHF solution at 20℃ for 30 minutes, no clouding or roughness on the surface is found by visual observation. On the other hand, the glass of Lautenschlager et al contains a large amount of MgO and is, therefore, assumed to be inferior in BHF resistance as compared with the glass of the present invention. To verify this, a joint inventor performed the experimental test to examine the chemical resistance of Example 12 which is closest in composition

to the glass of the present invention. As a result, roughness is caused by the BHF and change in surface condition was observed, as stated in the attached Declaration.

Lautenschlager et al mention, in paragraph [0036], the term "BHF". BHF generally means buffered hydrofluoric acid. However, in Lautenschlager et al, hydrofluoric acid is represented by this term.

In view of the above comments and the attached Declaration and Terminal Disclaimer, favorable reconsideration and allowance of claims 1, 2, 4-7 and 9-16 are respectfully solicited.

Respectfully submitted,

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Enclosure: Declaration
Terminal Disclaimer
Request for Extension; Terminal Disclaimer

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